Amendments to the Specification

Please amend the title as follows:

Travel ~~Direction~~ Guidance Device and Travel Warning ~~Direction~~ Announcement Device

Please replace the second paragraph on page 1, spanning pages 1 and 2, with the following amended paragraph:

Conventionally, this kind of travel direction of guidance device is integrated in a navigation device. The navigation device detects a current position using a current position detection means such as GPS receiver, and displays on a liquid crystal display the road map data corresponding to the current position via a recording medium such as DVD-ROM or network. An operator sets a destination, and a route searching means searches a recommended route and displays the route over the map on the liquid crystal display. When the vehicle comes near a diverging point such as a junction or an interchange, an enlarged portion of the diverging point or a three-dimensional map thereof is displayed, and a voice direction will tell the driver which direction to move or how far to the destination. The device receives road traffic information such as traffic congestion along the route from a road beacon of the VICS or FM multiplex broadcasting, or the information center, and displays the information on the liquid crystal display so as to give an alternative route avoiding the congestion.

Please replace the paragraph starting on the last line of page 2 and spanning pages 2 and 3 with the following amended paragraph:

Furthermore, it is typical of the driver's failure to forget to turn turning off various lighting equipment of the vehicle. Generally, the vehicle lights including the headlight for ~~illuminating~~ illumination during the night ~~drive~~driving, and turn signals indicating turning direction can be perceived by the driver from the indication on a dashboard panel when it is lit or operated. Therefore, for example, when the driver turns on the headlight while driving the tunnel during the day time, the indication on the dashboard panel will tell the driver if the light is still on or not so that the driver would not forget to ~~turning~~ turn the light off.

Please replace the last paragraph on page 3, spanning pages 3 and 4 with the following amended paragraph:

Moreover, the conventional travel direction device will tell the driver about the information on a traffic congestion along the route although it will not tell the roads used by the school children for their commute. The information on the commuting route of the school children can be useful for the driver to call his/her attention in an area where there are more school children. In the future, it might be possible to add data about the commuting route of the school children onto the road map data to warn the driver about such route based on the data. However, adding the school commuting route all over the country ~~require~~ requires enormous work and memory capacity, and thus, it would be difficult to realize it.

Please replace the first paragraph on page 4 with the following amended paragraph:

The conventional ~~drive~~ driver dozing prevention technique operates by detecting physical ~~condition~~ conditions more likely to occur during ~~the drive~~driving while dozing. The state of the dozing driver detectable by the conventional technique is already at the dangerous level. Therefore, there can be a case where the drive dozing is detected too late to secure the safety of the driver and any passenger on the vehicle.

Please replace the second paragraph on page 4 with the following amended paragraph:

The conventional navigation device gives voice direction to inform road ~~condition~~ conditions and traffic ~~condition~~conditions, but does not give any warning to the driver about detected driving ~~condition~~conditions. Specifically, even if the information regarding the traffic condition or the road condition is provided to the driver, the given information will not contribute to the safe driving unless the driver is conscious of the safe driving.

Please replace the last paragraph on page 4, spanning pages 4 and 5 with the following amended paragraph:

Furthermore, the conventional problem of forgetting to turn off the ~~headlight~~ headlights during the day or to turn on at night (in the dark) or forgetting to ~~return~~ turn off the turning signal are still often seen. The driver tends to forget to turn off the ~~headlight~~ headlights after driving through a tunnel because immediately after driving through the tunnel, the surroundings become so bright suddenly that the

driver forgets the ~~headlight is~~ headlights are still on. The driver tends to forget to turn on the ~~light~~ lights even at night when driving the lighted streets because the driver can see well enough without turning on the ~~headlight~~ headlights. The driver can forget to ~~return~~ turn off the turning signal when changing lanes where a degree of turn is relatively smaller than that of turning corners because the turning signal does not return automatically to the off position when, the turn is too small.

Please replace the first full paragraph on page 5 with the following amended paragraph:

A travel direction device of the present invention is characterized in that a direction about a traveling route is set, a notification of the direction is given less ~~frequent~~ frequently than a number of times the ~~a~~ car drives the traveling route if the car drives the traveling route plurality of times. Accordingly, the voice direction is not given all the time, and the user does not get annoyed by the voice direction.

Please replace the second full paragraph on page 5 with the following amended paragraph:

A travel direction device of the present invention is characterized in that the notification of the direction is given a predetermined number of times during a predetermined period of times. Accordingly, the user can set output of the voice direction to be given once in three times or once in four times, for example, and thus, the user does not get annoyed by it.

Please replace the last paragraph on page 5, spanning pages 5 and 6 with the following amended paragraph:

A travel direction device of the present invention is characterized in that there are a plurality of types of notification of the direction, and the notification of direction is given by selecting at least one of the plurality of types thereof. Accordingly, the voice direction is given not with the same content all the time but with ~~the~~ different contents, thus avoiding to ~~annoying~~ annoy the user by the voice direction.

Please replace the first full paragraph on page 6 with the following amended paragraph:

A travel direction device of the present invention is characterized in that when the car enters a predetermined area including the traveling route a plurality of times, the notification of direction is given less frequently than a number of times for the car ~~to enter~~ enters the predetermined area. Accordingly, the voice direction is not given every time the car enters the predetermined area, and thus, the user does not get annoyed by the direction.

Please replace the first paragraph on page 7 with the following amended paragraph:

As such, according to the present invention, a direction about a traveling route is given less frequently than a number of times the ~~a~~ car drives the traveling route if the car drives the traveling route plurality of times. Therefore, the user who drives the same route a number of times does not get annoyed by the

voice direction, and would not turnoff the voice direction function. Thus, it is possible to use the voice direction function effectively.

Please replace the second paragraph on page 7 with the following amended paragraph:

A travel direction device of the present invention is characterized in that the device has a controlling means for setting a predetermined area centered about a school as a school zone and giving warning about cautions during ~~direction for traveling~~ travel ~~cautions~~ when a car drives roads in the school zone based on school days information and time information. Thus, by using latitude/longitude information of the school address in the road map data, the school zone is set as an area within a radius of certain kilometers from the school, for example, and by assuming the roads included in the area as commuting roads for students, a warning is given vocally or by display based on the school day information except spring break, summer vacation, fall break, winter break, national holidays and other holidays, and the commuting time information, so that the safety of the driving within the school zone can be enhanced.

Please replace the last paragraph on page 7, spanning pages 7 and 8 with the following amended paragraph:

A travel direction device of the present invention is characterized in that the school zone is set depending on the school types such as kindergartens, elementary schools, middle schools, and other schools. Accordingly, the school zone is set reasonably by taking into consideration ~~of~~ commuting distance or activity

areas of children by setting it smaller for elementary school and larger for middle schools, for example.

Please replace the first full paragraph on page 8 with the following amended paragraph:

A travel direction device of the present invention is characterized in that the school zone is set depending on types of roads, such as vehicle-only roads, roads with or without pedestrian ~~walk~~ walks, main roads such as national roads, local roads, or narrow streets. Accordingly, by using the road type data included in the road map ~~date~~ data, the school zone is set smaller for the main roads such as national roads or the ~~road~~ roads with pedestrian ~~walk~~ walks because the vehicle roads and pedestrian ~~walk~~ walks are relatively far apart, for example, and the school zone is set larger for the narrow streets where the vehicle roads and pedestrian walks are relatively closer. Thus, the school zone is set reasonably.

Please replace the second full paragraph on page 8 with the following amended paragraph:

A travel direction device of the present invention is characterized in that the school zone is set depending on road density. Accordingly, information on a number of roads (links), total road distance or road width within a predetermined area included in the road map data is used to predict whether the area is ~~in~~ an urban area or suburban area, and thus the school zone is set reasonably by setting smaller for the urban area where the road density is high whereas larger for the suburban area where the road density is low.

Please replace the last paragraph on page 8 spanning pages 8 and 9 with the following amended paragraph:

A travel direction device of the present invention is characterized in that the school zone is set depending on area division. Accordingly, the area is set smaller for highly populated ~~area~~ areas whereas larger for less populated ~~area~~ areas where the commuting distance is generally longer, thus enabling to set the school zone reasonably.

Please replace the first full paragraph on page 9 with the following amended paragraph:

A travel direction device of the present invention is characterized in that the contents of the direction changes depending on school types such as kindergartens, elementary schools, middle schools and other schools. Accordingly, it is possible to give warning direction reasonably by varying a degree of warning. For example, the school zone for kindergarten, the degree is larger because small children may run into the streets suddenly. The school zone warning for elementary ~~school~~ schools has a moderate degree of warning because there still are possibility that the children run into the roads, while the degree may be less of the middle school because the students can be considered as ~~an~~ adults.

Please replace the second paragraph on page 9 spanning pages 9 and 10 with the following amended paragraph:

The contents may be varied depending on various factors. For example, the contents of the direction may be varied depending on road types such as vehicle-only roads, roads with or without pedestrian ~~walk~~ walks, main roads such as national roads, local roads, or narrow streets. Accordingly, for example, there is no need for the direction of the vehicle-only roads, whereas the degree of warning may be smaller for the roads with the pedestrian walks along side thereof, and larger for the roads without pedestrian walks. Thus, it is possible to give the direction reasonably. Moreover, the contents may be ~~changes~~ changed depending on ~~insolation~~ isolation duration of the area. The ~~insolation~~ isolation duration influences the hours of activities for school children, so the direction may be given corresponding to the ~~insolation~~ isolation duration of the area that differs area by area due to difference in latitude and longitude. The contents of the direction may be also changed depending on the vehicle speed. If the speed is fast, the degree of warning may be greater while the degree thereof may be less when driving slower.

Please replace the first full paragraph on page 13 with the following amended paragraph:

A travel warning direction device of the present invention is characterized in that the device comprises a monotony driving detection means for detecting whether ~~of~~ or not a car drives with a pre—set reference speed for a predetermined period of time when driving on local roads, and a voice output means for outputting a voice warning direction when the monotony driving detection means detects that the car drives within the reference speed range for the predetermined period of time. If the driver drives by maintaining a certain speed, the driver drives

monotonously, which ~~increase the~~ increases sleepiness. However, although the driver tends to ~~driver~~ drive in the certain speed in the expressways by using auto-drive function or auto-~~cruse~~ cruise function, if the monotony driving is detected while driving the local roads, the warning can be given relatively early so as to prevent doze driving in advance.

Please replace the third full paragraph on page 15 with the following amended paragraph:

A travel warning direction device of the present invention is characterized in that the unsafe driving detection means detects sudden ~~start~~ starts and ~~stop~~ stops of the car. Accordingly, when the means detects ~~the~~ a sudden start that is in danger of ~~crushing~~ causing a crash into other cars, or ~~the~~ a sudden stop that is in danger of ~~being crushed~~ causing a car to be hit by other cars, the warning is given to the driver of the ~~unsafety~~ unsafe activity, thus enabling to raise the driver's awareness of ~~the~~ safe driving.

Please replace the last paragraph on page 15, spanning pages 15 and 16 with the following amended paragraph:

A travel warning direction device of the present invention is characterized in that the unsafe driving detection means detects abrupt steering. Accordingly, when abrupt steering that is in danger of causing a ~~crush~~ crash or rolling is detected, the warning is given to the driver of the ~~unsafety~~ unsafe activity, thus enabling to raise the driver's awareness about the safe driving.**[[.]]**

Please replace the first full paragraph on page 16 with the following amended paragraph:

A travel warning direction device of the present invention is characterized in that the unsafe driving detection means detects abrupt steering by using an angular velocity sensor. Accordingly, by detecting the rotation angle of the vehicle by the gyro sensor using the angular velocity sensor or detecting steering angle by the angular velocity sensor provided to the steering wheel, it is possible to ~~detects~~ detect the abrupt steering.

Please replace the second full paragraph on page 16 with the following amended paragraph:

A travel warning direction device of the present invention is characterized in that the warning direction by the voice output means is given in a certain ratio relative to a number of times the warning is generated or irregularly. Accordingly, when unsafe driving such as sudden ~~start~~ starts, sudden ~~stop~~ stops or abrupt steering is detected, the warning is given only sometimes instead of each time in order to prevent the driver from feeling annoyed by the warning, thus enabling to raise awareness of the driver about the safe driving gradually.

Please replace the second full paragraph on page 17 with the following amended paragraph:

A travel warning direction device of the present invention is characterized in that the device comprises a time zone detection means for detecting whether or not the time is in the daytime; a lighting detection means for detecting

duration when the vehicle light is illuminated; and an output means for giving a warning direction to turn ~~on~~ off the vehicle light when the daytime zone is detected and the vehicle light is detected as being on for more than a certain period of time. Accordingly, if the headlight is turned on to drive through a tunnel during the daytime, for example, and if the driver forgets to turn off the light after driving the tunnel, the warning direction of voice or the like to tell the driver to turn off the light is given after a predetermined time period is elapsed, thus enabling to prevent the vehicle light from being forgotten to be turned off.

Please replace the second full paragraph on page 22 with the following amended paragraph:

In FIG. 1, the in—vehicle navigation device includes a direction sensor 1, a vehicle speed sensor 2, and various ~~sensor~~ sensors 3 detecting other factors than that of sensors 1 and 2. The direction sensor 1 uses a vibration gyro and detects moving direction of an own car. The vehicle speed sensor 2 generates a vehicle speed pulse corresponding to wheel rotation number of the vehicle having the device mounted thereon. The various ~~sensor~~ sensors 3 includes a sensor for detecting backward movement of the vehicle, a sensor for detecting parking of the vehicle, a sensor for detecting turning on of the light, a lighting intensity sensor for detecting lighting of the vehicle lights, a sensor for detecting switching on of the light, and a raindrop sensor for detecting rain fall and fog. The various ~~sensor~~ sensors 3 also ~~includes~~ include a sensor for detecting a position of a key switch of the vehicle, a sensor for detecting backward movement of the vehicle by a shift lever position, a sensor for detecting parking of the vehicle by a parking brake, a sensor for detecting

turning on of the light, a sensor for detecting changes in seat position, a sensor for detecting opening and closing of doors, and a sensor for detecting tilting angle of the steering wheel. A sensor signal processing portion (sensor signal processor) 4 calculates a moving direction of the vehicle based on a signal from the direction sensor 1, calculates a traveling distance and the vehicle speed from vehicle speed signal from the vehicle speed sensor 2, and generates a signal necessary for control based on a signal from various ~~sensor~~ sensors 3.

Please replace the first full paragraph on page 23 with the following amended paragraph:

A DVD-ROM drive 5 ~~read~~ reads out map data, voice data, voice recognition dictionary data and the like. A map obtained by reading the map data is displayed on a liquid crystal display 6. The liquid crystal display 6 displays a map, a current position and direction of the own car, an operation menu and the like. On a front surface of the display 6, a light receiving portion 6a is provided for receiving a signal from a remote control 7. The liquid crystal display 6 makes up a part of a warning output means, and has a function of displaying warning messages and the like other than the above described map, current position and direction of the own car, and the operation menu. An operation portion comprises the ~~The~~ remote control 7 and a touch panel and operation buttons provided on the front surface of the liquid crystal display 6. ~~consists a operating portion.~~

Please replace the last paragraph on page 23 spanning pages 23 and 24 with the following amended paragraph:

A GPS receiver 8 has a GPS antenna 9 and can calculate the current position (latitude and longitude) of the own car by receiving radio ~~wave~~ waves transmitted from a plurality of GPS satellites. The GPS antenna 9 is for receiving GPS radio ~~wave~~ waves. The navigation device has an external communication controller 10 ~~to have~~ having a transmitting function. The external communication controller 10 connects with a network such as the external Internet via a cell phone or the like. The DVD-ROM drive 5 is integrated with the liquid crystal display 6 and disposed on a dash board of the vehicle with the GPS receiver 8, and they are connected to a communication interface 13 of a device main body 12 through an in-vehicle LAN 11. The device main body 12 is mounted in a trunk of the vehicle or a center console in the car. The device main body 12 is connected to a microphone 14.

Please replace the first full paragraph on page 24 with the following amended paragraph:

The device main body 12 has, other than the above-described sensor signal processing portion 4 and a communication interface 13, a voice recognition portion 15 for receiving a voice signal from the microphone 14, an image processor 16, a recording portion 17, a voice processor 18, and a CPU 20 as a controlling means for controlling operation of the above-described ~~each~~ functions 4, 13, 15, 16, 17 and 18. The microphone 14 is disposed in the vicinity of the driver in the car, and is provided for inputting words from a user. The voice recognition portion 15 recognizes input voice by analyzing frequency of the word input from the microphone 14.

Please replace the last paragraph on page 24 spanning pages 24 and 25 with the following amended paragraph:

The image processor 16 processes for formation of a display image based on the map data, the data on current position of the own car, building data and the like. A storage portion 17 includes ROM with programs and data stored therein, RAM for storing task data temporarily, and VRAM for storing image data. A voice processor 18 ~~convert~~ converts phonemic symbol ~~sequence~~ sequences outputted as a result of voice recognition into voice signals, and ~~convert~~ converts voice data stored in the ROM of the storage portion 17 into voice signals. A speaker 19 outputs voice assist of search results, voice recognition result, voice direction including junction direction on the driving route, divergence direction, toll direction, exits direction, and school zone direction, and operation of the remote control, all based on signals from the voice processor 18. The speaker 19 may be a part of a warning outputting means along with the voice processor 18 so as to output voice direction such as warning direction. The CPU (central processing unit) 20 controls the entire device, executes software programs such as a current position calculating means, and a route searching means so as to implement functions as the navigation device, and processes the voice direction.

Please replace the last paragraph on page 25 spanning pages 25 and 26 with the following amended paragraph:

Next, as operations according to the present embodiment, a basic operation (route searching operation and route direction operation) for a navigation

device will be described. In FIG. 1, the device is turned on by a predetermined operation such as turning on of accessory power by turning engine key or the like. The current position searching means in the CPU 20 calculates precise current position of the own car based on position information from the GPS receiver 8 and data obtained by the sensor signal processing portion 4 processing signals from the direction sensor 1 and the vehicle speed sensor 2. Based on the vehicle position information, the CPU 20 reads corresponding road map data from the DVD-ROM through the DVD-ROM drive 5. The image processor 16 converts the map data into the image data ~~so as to~~ which is ~~store~~ stored in the VRAM of the storage portion 17 temporarily, and to convert the image data into color signals thereafter. Along with the car position, the road map data processed as above is displayed on the screen of the liquid crystal display 6 through the communication interface 13. The road map data may be obtained from an external server via the external communication controller 10. On the other hand, when an address of destination and the like is input through the microphone 14, the voice recognition portion 15 ~~recognized~~ recognizes the address, the CPU 20 ~~set~~ sets the address as the destination, and stores in the RAM of the storage portion 17. The route searching means in the CPU 20 calculates the best route from the current position of the car to the specified destination, and displays the route on top of the map on the liquid crystal display. As the driver drives the car along the guided route displayed on the liquid crystal display 6, the CPU 20 sequentially updates the current position mark of the own car on the liquid crystal display based on the current position information calculated by the current position detection means and road network data on the road map data. When the car comes near a divergence point in the guided route, the voice direction

added to the roadmap data is outputted from the speaker 19. The driver can drive to the destination in the shortest time without getting lost by the navigation of the navigation device.

Please replace the first paragraph on page 27 with the following amended paragraph:

The school zone is set in advance as an area within a radius of a certain kilometers centered about the school. The area of the school zone is set smaller for nursery schools, kindergarten, schools for disabled, and elementary schools, for example, and larger for middle schools. If the road width is more than 5.5 m, the school zone is set smaller by determining the school is in ~~the~~ an urban area, whereas the school zone is set larger for the road width less than 5.5 m by determining the school is in ~~the~~ a ~~suburb~~ suburban area. Moreover, it is possible to check if the roads in the closed area ~~is~~ are congested or not, and estimate whether the area is either in the urban or ~~suburb~~ suburban area. According to the governmental geographical divisions, the area may be set smaller for a highly populated area, and larger for a less populated area. Accordingly, it is possible to set the school zones reasonably.

Please replace the second paragraph on page 27 with the following amended paragraph:

The ROM in the storage portion 17 stores, as the school zone information, in addition to names and addresses of schools, and latitude and longitude information thereof, information on school days and commuting time zone

through the year except spring break, summer vacation, fall break, winter break, national holidays and other holidays is included. Also, the information of the speed limit when driving through the school zone, and various voice direction data for driving through the school zone are also stored. The school zone information may be stored in a memory card or on RAM of the storage portion 17 after being downloaded from the external server through the external communication controller 10.

Please replace the last paragraph on page 27 spanning pages 27 and 28 with the following amended paragraph:

When the car is going into the school zone obtained from latitude and longitude of the school in the school zone information, the current position detecting means detects that the car is going into the school zone from the current position obtained based on the information from the direction sensor 1, the vehicle speed sensor 2, the GPS receiver 8 and the like ~~give~~. Then, the CPU 20 performs the process shown in FIG. 2. FIG. 2 is a flow chart illustrating processing operation by the CPU 20 in a case where the car is driving into the school zone, as an example.

Please replace the first full paragraph on page 28 with the following amended paragraph:

In the operation, when the school zone is set to be told to the driver as information about the traveling route, whether or not the distance to the school zone ahead is less than 500 m is detected (Step S1). If the school zone is more than 500 m away, the same process is repeated until the school zone comes within 500 m.

When the school zone is detected within 500 m during the step S1, past voice direction regarding that particular school zone is referred from the record thereof so as to identify if the voice direction of the school zone has been given in the last one month (step S2). If the school zone had been directed within one month, the direction process is notified without ~~notifying~~ ended about the school zone.

Please replace the last paragraph on page 29 spanning pages 29 and 30 with the following amended paragraph:

Other than switching whether or not to give (i.e., whether or not to perform) the direction notification based on passage of a predetermined area such as school zones, switching of whether ~~performing~~ or not to perform the direction notification may be done when the direction is given along the traveling route such as roads that the car is driving (road divisions such as expressway, national road, prefectural road) and the driving points (particular points such as junctions or land mark points). The predetermined area may include a predetermined area including a predetermined traveling route (roads and points). Moreover, the switching of whether or not to give or not-give the direction may be set other than once in a predetermined period of time as described above. Specifically, it can be set to give the direction once in every predetermined number of times, or once or plurality of times in every predetermined traveling distance (herein, the plurality of times means giving the direction every time). Alternatively, it may be set to give the direction without recording the past notification and switch (or select) whether or not to give the direction notification corresponding to calculation result of a predetermined probability (50% or 10%, for example) for each time the direction is to be given.

Moreover, instead of switching whether or not to give or not-give the direction based on passage of the same area or the same traveling route, by considering a plurality of areas or traveling ~~route~~ routes such as school zones or expressway entrances as the same group, switching of whether or not to give and not-give the direction may be reflected in the same group existing in another position corresponding to switching of the with or without the direction on the traveling route of the same area. Accordingly, when driving through a plurality of school zones during one travel, for example, a direction notification more than desired is not performed by not giving the direction other than the first school zone (or a school zone fulfilling a predetermined conditions).

Please replace the last paragraph on page 32 spanning pages 32 and 33 with the following amended paragraph:

In the present embodiment, a CPU 20 controls the entire device, and performs software programs such as the current position calculating means and the route searching means to execute functions as the navigation device. The CPU 20 also process the voice direction to warn the driver when driving ~~road~~ roads in the school zone set centered about the school based on calendar information and time information from ~~an~~ a built—in timer.

Please replace the first full paragraph on page 33 with the following amended paragraph:

In Embodiment 2, the road map data stored in the DVD-ROM or obtained externally via the external communication control 10 includes information of

school positions (latitude/longitude) categorized by school types such as nursery schools, kindergarten, schools for disabled, elementary schools, and middle schools. The road map data also includes position information of ~~road~~ roads categorized by road types such as expressways, local roads, roads in 5.5 m or more wide, or roads in 3.0 m or more wide. Moreover, it includes position information and area division according to administrative districts.

Please replace the second full paragraph on page 33 with the following amended paragraph:

Based on those information, the school zone is set in advance within an area with a radius of ~~a~~ certain kilometers centered about a school while referring to an area in which each area ~~sets~~ sits as ~~an~~ a commuting area. The area of the school zone may be set smaller for areas centered about nursery schools, kindergartens, schools for disabled, and elementary schools so as to correspond to commuting distance or activities of pupils, for example, and set larger for areas centered about middle schools, thus enabling to set school zones appropriately corresponding to the school facility.

Please replace the last paragraph on page 33 spanning pages 33 and 34 with the following amended paragraph:

The distance between the vehicle and pedestrians tends to be longer when roads are wider, whereas the distance therebetween tends to be shorter when roads are narrower. Therefore, when the width of roads is 5.5 m or more, the school zone may be set smaller, whereas it may be set larger when the roads width is less

than 5.5 m. Accordingly, even if the vehicle is far from the school facility, the school zone can be set appropriately according to the road width.

Please replace the last paragraph on page 34 spanning pages 34 and 35 with the following amended paragraph:

In addition to the school types and positions as the school zone information, the ROM of the storage portion 17 includes information on school days through the year except winter break, spring break, summer vacation, national holidays, Sundays and so on when the school is closed, on the commuting time zone, and on the speed limit in the set school zone. Moreover, as notification data for notifying passage of the school zone, the ROM of the storage portion 17 also includes various voice direction data and display direction data. The notification data has wide variety of types corresponding to the above-described school types, road types, ~~insolation~~ isolation duration, school days, commuting time zone, speed limit, and the like. The voice direction data and display direction data may be stored in a changeable memory card or the RAM of the storage portion 17 by downloading from the external server through the external communication controller 10.

Please replace the first paragraph on page 36 with the following amended paragraph:

Other than the voice direction, display direction data may be used together with or independent from the voice direction while changing the degree of warning by varying a display size (including feature shape), display color, and display pattern (i.e., zooming in and out, or repeating the zoom-in and out, moving

the display vertically or horizontally, or repeating display state and non—display state alternately). In this case, the degree of warning can be increased by enlarging the display size, changing the color of the display in red or different color from the background color, or changing the pattern more drastically. If the warning degree is increased by using the voice direction data and the display direction data, the voice direction data can be used independently or together with the display direction data so that the driver can ~~recognized~~ recognize the direction without looking at the display, whereas the degree can be lowered by notifying only by the display direction data.

Please replace the first full paragraph on page 37 with the following amended paragraph:

For example, if the school zone No. 1 with the speed limit of 20 km/h as shown in FIG. 5 is ~~in~~ within 500 m from the current position, the voice direction saying "there is a school zone 500 m from here. Please drive under the speed limit of 20 km/h" is outputted from the speaker 19 (step S13). Next, by comparing with the current position, whether or not the car is in the school zone is checked (step S14), and if so, "you are now driving through the school zone. Please be careful of children. They may run into the street" is outputted from the speaker 19 (step S15). When the car is out of the school zone (step S16), the voice direction "you are out of the school zone. Please continue with your safe driving" is outputted from the speaker 19 (step S17), and the process is completed.

Please replace the second full paragraph on page 37 with the following amended paragraph:

The contents of the voice direction may be varied depending on types of roads. Specifically, the voice direction is not given for the vehicle only roads, the degree of warning is low for the roads with pedestrian ~~walk~~ walks provided on the side thereof, and the warning degree may be increased for the road without ~~the~~ a pedestrian walk. The voice direction may be changed depending on the ~~insolation~~ isolation duration of the area. Also, time zone for the children to be active may be different depending the ~~insolation~~ isolation duration that is different due to difference in latitude and longitude, and the voice direction may be set to be given for such time zones.

Please replace the last paragraph on page 38 spanning pages 38 and 39 with the following amended paragraph:

In this processing operation, when a traveling route to the destination is set, information on all the school ~~zone~~ zones along the traveling route ~~is~~ are read ~~form~~ from the ROM or the like of the storage portion 17, and the information is stored in the RAM as a table as shown in FIG. 5 (step S21). While the vehicle drives along the traveling route, whether or not the school zone exists within 500 m is monitored all the time by comparing to the current position (step S23).

Please replace the last paragraph on page 40 spanning pages 40 and 41 with the following amended paragraph:

In the present embodiment, the CPU 20 has an added function to realize a purpose of warning drivers ~~no~~ not to drive dozing. Therefore, the CPU 20 includes a continuous driving detection means 21, a monotonic driving detection means 22, and a driver change detection means 23 in addition to the current position calculation means and the route searching means for realizing the navigation function. The added means are executed as software.

Please replace the last paragraph on page 41 spanning pages 41 and 42 with the following amended paragraph:

Next, a warning direction operation for a long drive or long distance drive by the driver will be described. FIG. 8 is a flow chart illustrating processing operation of the warning direction by the CPU 20 in a case where the driver continues to ~~driver~~ drive for a long time or over a long distance.

Please replace the first full paragraph on page 42 with the following amended paragraph:

In the processing operation, the CPU 20 ~~activated~~ activates the continuous driving detecting means 21 as it recognizes from a signal from the sensor signal processing portion 4 that the accessory power is turned on by the vehicle key switch, and starts measuring the long time traveling or long distance traveling integrating traveling hours or traveling distance (step S31). When the vehicle leaves a driver' s house or from a parking lot to start driving, the above-described navigation device operates. Next, whether or not it drives expressways is checked (step S2). The roadmap data includes the road type data including expressways and local

roads, so ~~the~~ that it ~~recognized~~ recognizes from the current position information that the car is on the local ~~road~~ roads or on the expressway. If the car continues to drive on the local roads, the device proceeds to the operation shown in FIG. 9. If the car enters the expressway, the measurement of the long drive or long distance drive is reset, that is, integrated value is initialized (step S33). It initializes the value because when there is an expressway along the traveling route to the destination it is preferable to set the base point for measuring the long drive or long distance drive at a time the car enters the expressway.

Please replace the last paragraph on page 42 spanning pages 42 and 43 with the following amended paragraph:

Next, whether or not the car drives the expressway during the day time is checked (step S34). As an example, the day time herein refers to 6 a.m. to 6 p.m. while the night time refers to 6 p.m. to 6 a.m. However, it may vary from place to place and from season to season. When the car drives during the day time, whether or not the driving time exceeds 3 hours or the driving distance exceeds 300 km is checked (step S37), and if it exceeds 3 hours, the device recognizes that it is a long drive or long distance drive, and the warning direction to call for the driver's attention is outputted (step S36). The warning direction may change the expression or voice type such as voice of women or children depending on a time zone, season, events, or a number of times of traveling.

Please replace the first paragraph on page 44 and spanning pages 44 and 45 with the following amended paragraph:

When it is determined that the car is driving in the night time in the step S34, whether or not the driving time exceeds one hour or the driving distance exceeds 100 km is checked (step S35), and if so, it recognizes it is a long drive or long distance drive, and the warning direction may be outputted (step S36). After the warning direction, a reset process of step S33 is repeated, and the following processes are also performed repeatedly thereafter. During the day or the night, in a case where the car is not driven for a predetermined period or distance, whether the engine is stopped and the accessory power is turned off, and such conditions ~~continues~~ continue for more than 15 minutes or not is checked (step S38). If all conditions are satisfied, the device recognizes that the car has been parked in the service area or the parking area, so the driver is recovered from driving fatigue. Therefore, the reset process of the step S33 is ~~preformed~~ performed again so as to start other processes all over again. If the engine has not stopped nor the accessory power has not been turned off, or if the engine has stopped and the accessory power has been turned off for less than 15 minutes, a change of a driver is checked (step S39), and if the driver has been changed, the reset of the step S33 is performed, and the following processes are performed likewise. When the car is recognized as parked from the vehicle speed ~~senor~~ sensor, brake sensor, and parking sensor, and if the door sensor detects more than 2 doors including the driver's side door has been opened, the driver change detection means 23 of the CPU 20 determines that the driver has been changed. To determine the driver change, it is possible to add other conditions such as change of a seat position of the driver's seat by the seat position sensor, an angle adjustment of rearview mirror or side mirror by the mirror position sensor, a change in the tilting angle of the steering wheel by the tilting angle

sensor for the steering wheel. If the driver has not been ~~change~~ changed, whether or not the car exits the expressway is checked (step S40), and if it is still on the expressway, steps following the step S34 are repeated. If the car drives on the local roads after exiting the expressway, the device proceeds to step S44 in FIG. 9.

Please replace the first full paragraph on page 45 with the following amended paragraph:

As shown in FIG. 9, when the car leaves from the driver's house or a parking lot and drives on the local roads, the CPU 20 checks if it is during the day time (step S41). If it is the day time, whether or not the driving time exceeds 2 hours or the driving distance exceeds 100 km is checked (step S45), and if it exceeds those amounts, it recognizes that the driver drives long hours or long distance, thus outputting the warning direction (step S43). If it is the night time, whether or not the driving time ~~exceed~~ exceeds one hour or the driving distance exceeds 60 km is checked (step S42), and if it exceeds it, it is recognized as a long drive or long distance drive, and the warning direction is outputted in step S43 likewise. After the warning is given, the measurement for the long drive or long distance drive is reset (step S44).

Please replace the last paragraph on page 45 spanning pages 45 and 46 with the following amended paragraph:

During the day or the night, if the driving time or the driving distance is less than a predetermined value, the monotonic driving detection means 22 of the CPU 20 checks if the driver drives monotonously (step S46). The monotonic driving

as ~~uses~~ used herein means driving within a range of reference speed on a local road for a certain period of time. For example, as shown in FIG. 10, assume that the lower value of the reference speed is 40 km/h, a speed range of the monotonic driving is ±5 km/h, and the reference speed (reference speed candidate) is in increments of ±5 km/h. The ~~monotony~~ monotonic driving detection means 22 measures a continuous duration of the speed range of the monotony driving from a time t1 as a base, which is the first point where the reference speed reaches ±5 km/h after t2 where the car reaches the reference speed 40 km/h. If the driving speed is out of the speed range of the reference speed, the speed of the t4, which is the moment when the car drives out of the reference speed range, is set as a new reference speed (obtained by adding or subtracting ±5 km/h from the first reference speed). By setting a base point as t3 in which the car reaches ±5 km/h of the new reference speed, the monotony driving is measured again for the continuous duration for the speed range. If the continuous duration of the monotony driving in the speed range exceeds one hour, it is recognized as the monotony driving.

Please replace the first full paragraph on page 47 with the following amended paragraph:

If the monotony driving is not detected in the step S46, ~~if~~ whether or not the duration of the engine stop and turning off of the accessory power continues for l5 minutes or more is checked (step S47). If these conditions are met, ~~if~~ whether or not the ignition key is out and the door is locked are checked from signals from various sensors 3 (step S50), and if so, it is recognized as that the driver is back home, or parked the car in a parking lot for shopping or dining. Then, a series of the

processes is completed. If the door is not locked, it is recognized as that the driver has taken a break to recover from fatigue, and the step S44 for resetting is performed so as to return to the step S41. Then, the same process will start again. If the engine is not stopped nor the accessory power is not turned off, or the engine is stopped and the accessory power is turned off only for less than 15 minutes in the step S47, a change of the driver is checked (step S48). If the driver has been changed, the reset process of the step S44 is performed and the processes that follow are repeated. If the driver has not been changed, whether or not the car is on the expressway is checked (step S49), and if it enters the expressway, steps following the step S3 in FIG. 8 are repeated. If not on the expressway and still on the local roads, the process returns to the step S4l.

Please replace the first full paragraph on page 49 with the following amended paragraph:

In the present embodiment, the CPU 20 has a function added especially for realizing a purpose of ~~raise~~ raising awareness of the driver for the safe driving by encouraging the driver. The CPU (central processing unit) 20 has ~~a~~ an unsafe driving detection means 24 in addition to the current position calculating means and the route searching means for the navigation functions, and these means are executed as software.

Please replace the second full paragraph on page 49 as follows:

In the present embodiment, a vibration gyro, i.e., angular velocity sensor, is used as the direction sensor 1, and it detects not only the moving direction

of the vehicle, but also abrupt steering of the steering wheel. Moreover, in the present embodiment, an acceleration sensor 3a is added or included in the various sensors 3 shown in FIG. 3. The acceleration sensor 3a detects both acceleration and deceleration, and can detect sudden ~~start~~ starts and ~~stop~~ stops of the vehicle. The speaker 19 and the voice processor I8 makeup the voice output means, and they output voice ~~warning to~~ warnings of the sudden ~~start~~ starts, sudden ~~stop~~ stops, or abrupt steering in addition to the various directions such as search results or voice recognition results, and operation contents from the remote control 7.

Please replace the first full paragraph on page 50 with the following amended paragraph:

In the processing operation, the vehicle speed sensor 2 operates all the time while the car is moving, and the vehicle speed pulse from the vehicle speed sensor 2 counted by a counter in the CPU 20 that counts a number of ~~pluses~~ pulses in 2 seconds so as to detect the vehicle speed. The acceleration sensor 3a also operates all the time while the car is moving. For example, in case of the capacitance acceleration sensor, a pendulum serving as the sensor is used as one of the poles of a capacitor. When acceleration force is added to the pendulum, capacitance of the capacitor changes due to displacement of the pendulum. Based on the change, acceleration (+) and deceleration (—) can be detected. The unsafe driving detection means 23 of the CPU 20 monitors acceleration value by inputting the signals from the acceleration sensor 3a (step S51). Whether or not the input acceleration is more than the reference value and the vehicle speed is faster than the reference value is checked to determine unsafe driving (step S52). If it is

recognized as unsafe driving, the CPU 20 ~~read~~ reads the warning voice signal among other voice signals stored in the ROM of the storage portion 17 so as to output the warning from the speaker 19 from the voice processor 18 to warn the driver (step S53).

Please replace the last paragraph on page 50 spanning pages 50 and 51 with the following amended paragraph:

A corresponding table of the acceleration and the vehicle speed as shown in FIG. 12B is stored in the ROM of the storage portion 17. When a value G of acceleration is above G1, and the vehicle speed V is above V1, then it is determined as unsafe driving. Determination of the unsafe driving is set so that the larger the vehicle speed V gets, the greater the acceleration value G becomes. These values are obtained by way of experiment. Even if the detected acceleration is the same, it is programmed in such a way that the warning is outputted when the vehicle speed is too fast whereas the warning is not outputted when the vehicle speed is slow. The warning voice may include, for example, "Watch out" "You'll ~~crush~~ crash" or "You'll be hit".

Please replace the first full paragraph on page 52 with the following amended paragraph:

The ROM of the storage portion 17 has a corresponding table of direction difference and vehicle speed as shown in FIG. 13B stored therein. When a value θ of the direction difference is θ 1 or above, and when vehicle speed V is V1 or above, it is considered that the driver drives unsafely. The determination of the

unsafe driving is set in such a manner that the larger the vehicle speed V, the smaller that value θ. These values are obtained by way of experiment. It is programmed in such a manner that even if the detected direction difference is the same, the warning is outputted when the vehicle speed is large, whereas the warning is not outputted when the vehicle speed is small. The warning voice may be, for example, "Watch out" or "You'll ~~crush~~ crash" and the like.

Please replace the last paragraph on page 52 spanning page 52 and 53 with the following amended paragraph:

As such, in the present embodiment, the unsafe driving detection means 23 determines whether the driver drives safely or not by comparing the predetermined reference value if the driver makes abrupt steering. If unsafe driving is determined, the warning is outputted by voice, thus enabling to raise the driver's awareness for ~~the safety drive~~ driving.

Please replace the first full paragraph on page 54 with the following amended paragraph:

The CPU 20 in the present embodiment has an added function for realizing a purpose for encouraging the driver's attention to prevent the vehicle light from being forgotten from turning off or on. Therefore, time zone information 17a is stored in the ROM or RAM of the storage portion 17. The CPU 20 includes a time zone detection means 25 and a lighting detection means 26 in addition to the current position calculating means and the route searching means for realizing the navigation function, and they are executed as software. A calendar portion 27

provides the data information of the CPU 20. As various sensors 3, an illumination sensor for detecting lighting of the vehicle light, a sensor for detecting turning on of the lighting switch, and a raindrop sensor for detecting rain and fog are used for the present embodiment.

Please replace the last paragraph on page 55, spanning pages 55 and 56 with the following amended paragraph:

The position information in the time zone information 17a may be set based on the governmental district included in the road map data instead of using the longitude/latitude information. The daytime time zone may be set starting from a predetermined hours later ~~from~~ than sunrise to a predetermined hours before the sunset so as to include a twilight hours in the night time zone instead of in the daytime hour. In the above-described example, the time zone for the day time is from about 7:20 a.m. to 4:20 pm. After the time zone information is obtained, the CPU 20 checks if the current time is in the daytime time zone (step S72). If the current time is not within the daytime hours, i.e., when the current time is in the night time zone, the processes of FIG. 16 are performed thereafter. If it is the daytime hour, a step S73 is performed. The lighting detection means 23 of the CPU 20 checks if the light-on signal is inputted (step S73). If it is not inputted, it returns to the step S71. If it is inputted, the CPU checks if 5 minutes have elapsed (step S74). If 5 minutes have already elapsed, whether or not the car is driving in the tunnel is checked (step S75), and if not so, then whether the car is driving under adverse weather conditions such as heavy rain or fog is checked (step S76). If the car is neither in the tunnel nor under the bad weather, whether or not the accessory power

is on is checked. (step S77). If the accessory power is off, then the process is completed, and if it is not off, the warning direction is given to turn off the light (step S78). If the car is driving in the tunnel, or under the bad weather, it returns to the step S71 without outputting the warning direction.

Please replace the first full paragraph on page 57 with the following amended paragraph:

In the step 72 of FIG. 15, if the current time is not in the daytime zone, i.e., if the current time is at night, whether or not the light-on signal is inputted is checked in the step S79 of FIG. 16. If it is inputted, it returns to the step S71, and if not, whether or not the same condition continues for 10 minutes is checked (step S80). A time period of 10 minutes can be set arbitrarily, but in this case, it is set to 10 minutes out of consideration ~~of~~ that the time is still the beginning of night time zone where the ~~surrounding~~ surroundings ~~is~~ are still in ~~the~~ twilight without a need to turn on the light, and ~~of~~ that the ~~surrounding~~ surroundings may be bright enough even if the light is forgotten to be turned on. When 10 minutes have elapsed, whether or not the accessory power is on is checked (step S81), and if it is off, the process is completed. If it is not off, the warning direction to turn on the light is outputted (step S82), and the process is returned to the step S71 of FIG. 15.

Please replace the last paragraph on page 57 spanning pages 57 and 58 with the following amended paragraph:

As such, according to the present embodiment, the time zone detection means 22 obtains time zone information that matches the current data and time from

the time zone information 17a of the storage portion 17 to detect whether the current time belongs to the time zone for daytime or nighttime. The lighting detection means 23 detect if the vehicle light is turned on or not. If the lighting detection means 23 detects that the light is on for more than predetermined period of time during the daytime time zone, the voice warning direction to tell the driver to turn off the light is outputted. If the lighting detection means 23 detects that the light is not on for more than a predetermined period of time during the nighttime time zone, the voice warning direction to tell the driver to turn on the light is outputted. Therefore, it is possible to prevent that the headlight or turning signals is forgotten from turned off during the day, and to prevent that the headlight or the illumination light is forgotten to be turned on at night. When the car is in the tunnel under the heavy traffic or driving under the bad weather, the light is on continuously even during the daytime. By not outputting the warning under such circumstances, it is possible to ~~response~~ respond realistically.